

POUCHED GRANULAR DETERGENT COMPOSITIONS CONTAINING HYGROSCOPIC BUILDERS

This is a continuation of application Ser. No. 07/148,727, filed on Jan. 26, 1988, now abandoned.

TECHNICAL FIELD

The present invention relates to pouched granular detergent compositions containing a detergent surfactant, preferably an aluminosilicate ion exchange material, water-soluble neutral or alkaline hygroscopic builder salt, preferably comprising ether carboxylate builders as defined herein. The compositions herein, can contain no or only low levels of phosphate materials and preferably less than about 4% by weight of alkali metal silicate materials.

BACKGROUND OF THE INVENTION

Granular detergent compositions have, in the past, often contained high concentrations of phosphate builder materials, particularly sodium tripolyphosphate. When a crutcher mix containing sodium tripolyphosphate is spray-dried, it is believed that enough mixed-phosphate hydrolysis products are formed to inhibit phosphate crystal growth. The hydrolysis products are concentrated in the liquid phase which finally dries to an amorphous glassy phosphate material. This glassy material effectively "cements" the finely crystalline granule walls together, producing granules which exhibit very desirable physical properties, i.e., crisp, durable and free-flowing granules. Moreover, the glassy phosphate material readily disintegrates in the laundering solution so that no insoluble residue is left on the fabrics.

Alkali metal silicates are usually included in granular detergents at low levels for corrosion inhibition and processing reasons. When phosphate builders are removed from detergents, the level of silicate is often increased severalfold since it also dries to a tough glassy film capable of strengthening granule walls and enhancing free-flowing characteristics. Silicates having a lower SiO₂ to alkali metal oxide ratio (e.g., 1.6-2.0) are usually selected because they are more water-soluble than the higher ratio silicates. However, exposure of the silicate to carbon dioxide during drying and storage can shift its ratio to a higher value and reduce its solubility, resulting in detergent granules which do not completely disintegrate in the laundering solution, and an unacceptably high level of insoluble material being deposited on fabrics. The insolubles problem can be particularly severe when the detergent composition also contains water-insoluble aluminosilicate material since higher levels of silicates (e.g., above about 3%) enhance the deposition of the aluminosilicates onto fabrics. This solubility problem is compounded further in a pouched detergent form product.

An annoying problem with air/water-permeable pouched granular detergent is dusting when the pouch is removed from its package for use in the washing machine.

The use of hygroscopic builders, particularly at higher levels, can improve granular detergent solubility. However, they have been avoided in granular form due to granular stickiness and caking upon storage. Detergent stickiness and caking are usually associated

with decreased solubility and undesirable flow properties.

SOME OBJECTS OF THE PRESENT INVENTION

It is therefore an object of the present invention to provide a pouched laundry hygroscopic granular detergent composition dispenser that is disposable in nature and which will dispense the laundry detergent in a simple and efficient manner during the wash period of an automatic clothes washing machine.

Another object of the present invention is to provide a porous pouched laundry detergent dispenser with reduced dusting.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a water-permeable, water-insoluble laundry active dispenser with central agitating post loops and containing pouched laundry actives, which is a preferred pouched dispenser.

FIG. 2 is a top flat view of the pouched laundry active dispenser of FIG. 1.

FIG. 3 is a perspective view of the laundry active dispenser of FIG. 1 positioned about a central agitating post of an automatic clothes washing machine.

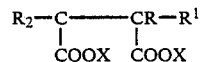
SUMMARY OF THE INVENTION

The present invention encompasses a porous, pouched hygroscopic granular detergent composition and a method of dispensing said hygroscopic granular detergent into the wash water of a washing machine.

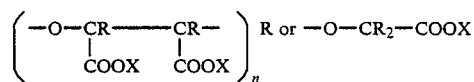
DETAILED DESCRIPTION OF THE INVENTION

The present invention encompasses a porous, pouched hygroscopic granular detergent composition comprising:

- from about 5% to about 45% by weight of an organic surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and cationic surfactants, and mixtures thereof;
- from about 5% to about 75% by weight of water-soluble neutral or alkaline salt comprising from about 1% to about 55%, by weight of the granular detergent composition, of a hygroscopic builder salt selected from the group consisting of: organic salts of citrate, formate, malate, succinate, acetate, tartrate, and ether polycarboxylate builder having the formula:



wherein each R is selected from the group consisting of H, and OH with no more than one OH group being attached to any one carbon atom; R¹ is either a group having the formula



wherein each X is selected from the group consisting of H and cations which make the ether polycarboxylate builder water soluble and n is from 0 to 4; and said composition contains less than about 10% by weight of phosphate materials, said composition